

REMARKS

The Examiner is thanked for the thorough examination of the present application and the withdrawal of all previous rejections. The Office Action, however, continued to reject all examined claims 11, 12, 15, and 19-21. Specifically, claim 11 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Matsuda et al (US 4,596,994) in view of Andrews et al (US Pub. 2004/0085435) and Fouquet et al (US 5,699,462). In response, Applicant submits the foregoing amendments and the following distinguishing remarks.

Independent claim 11 is amended to more clearly identify a novel and non-obvious feature of the porous material. Support for the amendment can be found in FIG. 5 of the application. Claim 19 is amended to more clearly identify a novel and non-obvious feature of the porous material. Support for the amendment can be found in FIG. 8D of the application. Claim 20 is amended to more clearly identify a novel and non-obvious feature of the porous material. Support for the amendment can be found in FIG. 7 of the application. Claims 22-25 are added to more clearly identify certain novel and non-obvious features of the porous material. As all the claim amendments are supported by the original application, the amendments add no new matter to the application, and the rejections should be withdrawn.

As amended herein, independent claim 11 recites:

11. An inkjet printhead comprising:
a substrate;
a heating layer disposed on the substrate to dispense liquid;
a conductive layer disposed on the substrate to conduct a current
to the heating layer, wherein the conductive layer comprises a stepped

portion used as a heating area, wherein the heating area is defined by the conductive layer and the heating layer;

a polymer disposed on the substrate;

a porous material disposed on the polymer, wherein the porous material is substantially parallel with the heating area; and

a chamber, formed by the polymer and porous material, having a first side and a second side, wherein the first side is overlapped with the heating area, the second side is connected to the first side, and the chamber is formed with an exit, from which the liquid is dispensed, on the second side, and the liquid flows into the chamber through the porous material.

(Emphasis Added). Claim 1 patently defines over the cited art for at least the reason that the cited art fails to disclose the features emphasized above.

As reflected above, claim 11 defines an inkjet printhead comprising a substrate, a heating layer, a conductive layer, a polymer, a porous material, and a chamber. The heating layer is disposed on the substrate to dispense liquid. The conductive layer is disposed on the substrate to conduct a current to the heating layer, and comprises a stepped portion used as a heating area. The heating area is defined by the conductive layer and the heating layer. The polymer is disposed on the substrate. The porous material is disposed on the polymer, and is substantially parallel with the heating area. The chamber is formed by the polymer and the porous material, and has a first side and a second side. The first side is overlapped with the heating area, and the second side is connected to the first side. The chamber is formed with an exit, from which the liquid is dispensed, on the second side. The liquid flows into the chamber through the porous material.

In contrast, Matsuda relevantly discloses a liquid jet recording head. On the top surface of the substrate 1, there is laminated the resistive heat generating layer 2, over

which the electrode layer 3 is further laminated. In the recording head, the orifices 302 are formed in and along the direction of the liquid flow path 304.

Andrews relevantly discloses a pleated laser ablated filter. The thin film polymer layer 302 as shown in FIG. 7 is folded at the fold lines 314 by crimping or other mechanical means to form a pleated filter 316.

Fouquet relevantly discloses a total internal reflection optical switches employing thermal activation. The spacer layer 192 is preferably an adhesive polymer related to those used to form inkjet chamber walls.

In the “Response to Arguments” section, the Office Action stated that Andrews discloses that the filter can be bonded at various points along the ink flow path (Paragraph 0013). Therefore, when the filter is placed in the ink path (304) of Matsuda, a chamber will be formed starting at the placement of the filter and ending at the nozzle orifice (302). However, in amended claim 11, the porous material is substantially parallel with the heating area. Specifically, if the filter of Andrews is placed in the ink path (304) of Matsuda in a manner such that the filter is substantially parallel with a heat generating portion 303 of Matsuda, a chamber cannot be formed.

None of Matsuda, Andrews, or Fouquet teaches that the porous material is substantially parallel with the heating area. Thus, the even if these references could be properly combined, the resulting combination still fails to teach all the features of the claimed combination. For at least this reason, the rejection of claim 11 should be withdrawn. Insofar as claims 12 and 15 depend from claim 11, the rejections of these claims should be withdrawn for the same reasons. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuda in view of Andrews and Park. Applicant respectfully requests reconsideration and withdrawal of this rejection for at least the reasons discussed below.

Independent claim 19 recites:

19. An inkjet printhead comprising:
a substrate;
a heating layer disposed on the substrate to dispense liquid;
a conductive layer disposed to conduct a current to the heating layer, wherein the conductive layer comprises a stepped portion used as a heating area, wherein the heating area is defined by the conductive layer and the heating layer;
an adhesive layer disposed on the conductive layer;
a porous material, disposed on the substrate, including a chamber, wherein the liquid flows to the chamber through the porous material, the chamber has a first side and a second side, the first side is overlapped with the heating area so that the liquid in the chamber is located above the heating area, and the second side is connected to the first side; and
a nozzle plate, disposed on the second side of the chamber, including at least one orifice, wherein the nozzle plate abuts the porous material.

(*Emphasis Added*). Claim 19 patently defines over the cited art for at least the reason that the cited art fails to disclose the features emphasized above.

As reflected above, claim 19 defines an inkjet printhead comprising a substrate, a heating layer, a conductive layer, an adhesive layer, a porous material, and a nozzle plate. The heating layer is disposed on the substrate to dispense liquid. The conductive layer is disposed to conduct a current to the heating layer, and comprises a stepped portion used as a heating area. The heating area is defined by the conductive layer and the heating layer. The adhesive layer is disposed on the conductive layer. The porous material is disposed on the substrate, and includes a chamber. The liquid flows to the chamber through the porous material. The chamber has a first side and a

second side. The first side is overlapped with the heating area so that the liquid in the chamber is located above the heating area, and the second side is connected to the first side. The nozzle plate is disposed on the second side of the chamber, and includes at least one orifice. In addition, claim 19 expressly recites that the nozzle plate abuts the porous material.

In contrast, Park discloses an ink-jet printhead having a structure in which a base plate, a barrier wall, and a nozzle plate are stacked.

In the “Response to Arguments” section, the Office Action stated that Andrews discloses that the filter can be bonded at various points along the ink flow path (Paragraph 0013), therefore when the filter is placed in the ink path (304, Figure 3) of Matsuda, a chamber will be formed starting at the placement of the filter and ending at the nozzle orifice (302). However, as expressly recited in amended claim 19, the nozzle plate abuts the porous material. In contrast, if the filter of Andrews is placed in the ink path (304) of Matsuda in a manner such that the filter abuts the nozzle orifice (302) of Matsuda, a chamber cannot be formed.

Thus, none of Matsuda, Andrews, or Park teaches that the nozzle plate abuts the porous material. Thus, even if these references could be properly combined, the resulting combination still fails to teach the combination of claimed features. For at least this reason, claim 19 patently defines over the cited art.

Claims 20-21 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Matsuda in view of Andrews and Inamoto et al (US 4,609,427).

Applicant respectfully requests reconsideration and withdrawal of the rejections for at least the reasons discussed below.

Claim 20 recites:

20. An inkjet printhead comprising:
a substrate;
a heating layer disposed on the substrate to dispense liquid;
a conductive layer disposed on the substrate to conduct a current to the heating layer, wherein the conductive layer comprises a stepped portion used as a heating area, wherein the heating area is defined by the conductive layer and the heating layer;
a metallic layer disposed on the substrate;
a porous material disposed on the metallic layer, **wherein the porous material is substantially parallel with the metallic layer**; and
a chamber, formed by the metallic layer and porous material, having a first side and a second side, wherein the first side is overlapped with the heating area, the second side is connected to the first side, and the chamber is formed with an exit, from which the liquid is dispensed, on the second side, and the liquid flows into the chamber through the porous material.

(Emphasis Added). Claim 20 patently defines over the cited art for at least the reason that the cited art fails to disclose the features emphasized above.

As reflected above, claim 20 defines an inkjet printhead comprising a substrate, a heating layer, a conductive layer, a metallic layer, a porous material, and a chamber. The heating layer is disposed on the substrate to dispense liquid. The conductive layer is disposed on the substrate to conduct a current to the heating layer, and comprises a stepped portion used as a heating area. The heating area is defined by the conductive layer and the heating layer. The metallic layer is disposed on the substrate. The porous material is disposed on the metallic layer, and is substantially parallel with the metallic layer. The chamber is formed by the metallic layer and the porous material, and has a first side and a second side. The first side is overlapped with the heating area. The second side is connected to the first side. The chamber is formed with an

exit, from which the liquid is dispensed, on the second side. The liquid flows to the chamber through the porous material.

In contrast, Inamoto discloses a method for producing ink jet recording head. For the purpose of imparting electrical insulation, there is provided a coating of a protective layer 3.

In the “Response to Arguments” section, the Office Action stated that Andrews discloses that the filter can be bonded at various points along the ink flow path (Paragraph 0013) on the protective (metal) coating of the substrate (Inamoto; Figure 6; Column 3, Line 66 – Column 4, Line 11), therefore when the filter is placed in the ink path (304) of Matsuda, a chamber will be formed starting at the placement of the filter and ending at the nozzle orifice (302). However, in amended claim 20, the porous material is substantially parallel with the metallic layer. Specifically, if the filter of Andrews is placed in the ink path (304) of Matsuda in a manner such that the filter is substantially parallel with the protective (metal) coating of the substrate of Inamoto, a chamber cannot be formed.

Consequently, none of Matsuda, Andrews, or Inamoto teaches or suggests that the porous material is substantially parallel with the metallic layer. Thus, even if these references could be properly combined, the resulting combination fails to disclose all features of the claimed combination. For at least this additional reason, claim 20 patently defines over the cited art, and the rejection of claim 20 should be withdrawn. Insofar as new claims 22-25 depend from claim 20, these claims patently define over the cited art for at least the same reasons.

For at least the foregoing reasons, all pending claims define over the cited art and the rejections should be withdrawn.

A credit card authorization is provided herewith to cover the fee associated with the accompanying petition for extension of time. No additional fee is believed to be due in connection with this submission. If, however, any additional fee is deemed to be payable, you are hereby authorized to charge any such fee to Deposit Account No. 20-0778.

Respectfully submitted,

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